MZB1 Regulates the Immune Microenvironment and Promotes Ovarian Cancer Cell Migration

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Objective: The immune microenvironment of ovarian cancer plays a pivotal and indispensable role in driving its progression, and the emerging recognition of MZB1's substantial involvement in shaping the tumor immune microenvironment (TIME) underscores its growing significance. However, the role of MZB1 in ovarian cancer remains mysterious. We endeavor to elucidate the role and mechanism of MZB1 in ovarian cancer, thereby promoting the clinical application of MZB1.

Design: This study explores the role and mechanism of MZB1 in ovarian cancer through an integrated approach combining bioinformatics analysis with cell and molecular biology experiments.

Method: A total of 381 samples from the TCGA dataset were analyzed. Differentially expressed genes (DEGs) were compared using DEseq2. Multiple algorithms were employed to assess the relevance between MZB1 and the TIME. In both conditions of MZB1 overexpression and knockout, cell proliferation was evaluated using the CCK-8 assay, while cell migration was assessed through the wound healing assay. Subsequently, a nomogram was developed for predicting 3- and 5-year overall survival based on multivariable Cox regression results. The performance of these nomograms was evaluated using a C-index and calibration plot to determine their discriminative ability and calibration.

Results: Our findings revealed a positive correlation between high MZB1 expression and improved clinical prognosis. Elevated MZB1 promotes migration of SKOV3 cells, but has no effect on proliferation. Furthermore, higher MZB1 expression was associated with increased infiltration of immune cells within the tumor microenvironment. The C-

index was 0.702 (0.680-0.724), and the nomogram demonstrated good calibration through the calibration curve, indicating satisfactory discrimination and calibration in predicting patient outcomes.

Conclusions: This study offers a comprehensive understanding of MZB1 and its implications, paving the way for novel avenues in personalized treatment approaches.